1921

MEMORANDA AND INDEX OF CULTURES OF UREDINEAE, 1899–1917

J. C. ARTHUR

[Reprinted from MYCOLOGIA, Vol. XIII, No. 4 and 5, July–Sept., 1921.]

MEMORANDA AND INDEX OF CULTURES OF UREDINEAE, 1899–1917

Reprinted from MYCOLOGIA, Vol. XIII., No. 4 and 5, 1921.]

MEMORANDA AND INDEX OF CULTURES OF UREDINEAE, 1899–1917[1]

J. C. ARTHUR

The cultures of the rusts, which were conducted under the auspices of the Purdue University Agricultural Experiment Station, and extended over a period of nineteen years, had a small beginning. For the first three years only such time was given to the work as the writer could spare from his duties as head of the Botanical Department of the Station and as Professor of Vegetable Physiology and Pathology in Purdue University. In most of the following years an assistant was especially employed during two or so months each spring, who had entire charge of the testing of spore viability, sowing of the spores, and care of the inoculated plants, the chief part of the culture work being done during May and June. The position was held by fourteen individuals, selected with the needs of the work especially in view, and ranging from a junior high school student to university instructors, who without exception showed superior ability in conducting the work. Financial support was provided by a grant from the Botanical Society of America in 1903, 1906 and 1907, and by coöperation with the Bureau of Plant Industry of the U. S. Department of Agriculture in 1904 and 1905. In the other years it was supplied by the Purdue University Agricultural Experiment Station, and from 1908 onward the work was made a part of the rust project under the Adams fund.

During the progress of the work the writer, usually accompanied by an associate, made many shorter or longer excursions for securing data and material. These field observations were directed toward detecting the juxtaposition of spore-forms that might be supposed to have genetic connection, as well as toward securing suitable culture material. The fruitfulness of this method is apparent from the fact that during the extended study

[1] Contribution from the Botanical Department of the Purdue University Agricultural Experiment Station.

of heteroecious species only three times was a discovery of alternate hosts effected that was not the outcome of a previous field observation. In two of these cases, that of *Uromyces acuminatus* (more properly *U. Steironematis,* see page 76,* Jour. Myc. **12**: 25), and *Puccinia Ceanothi* (see page 196,* Mycologia **4**: 27) sowings were made on all available hosts in the greenhouse, recorded as bearing aecia, and in the case of *P. fraxinata* (*P. peridermiospora,* see page 8,* Bot. Gazette **29**: 275), a morphological similarity was detected between aesciospores and urediniospores, leading to successful cultures.

Beginning with the immediate vicinity of Lafayette, Indiana, the range of observations was extended to various parts of the state, and in the ninth year of the work, 1907, to other states. This year a trip was made to the foothills of Colorado, which was repeated in 1908, 1911 and 1916, observations being made from Boulder to Trinidad, and once westward to Ouray and Durango. Between 1908 and 1916 trips were made northward to Wisconsin and Michigan, eastward to Maine and Pennsylvania, to South Carolina, Alabama and Mississippi in the south, and to Texas, New Mexico and Arizona in the southwest. So far as possible places were selected where there were local collectors, or where records showed that species requiring investigation had at some time been secured. The chief collecting grounds of Ellis in New Jersey, Ravenel in North and South Carolina, Atkinson and Underwood in Alabama, and Kellerman in Kansas were visited, and the collecting grounds of Schweinitz at Salem, North Carolina, and Bethlehem, Pennsylvania, would have been visited, if opportunity had favored. In this way many obscure names in the literature were connected with living material on which fresh and more extended studies, often including cultures, could be carried out. By this method the attention given to the genus Gymnosporangium was made to expand our limited knowledge of a few species into an understanding of the life history of some two dozen species and of their alternate hosts. The effectiveness of the work with Gymnosporangium was greatly enhanced by the special interest in it taken by my asso-

* For explanation of these page numbers see p. 246 at beginning of the index.

ciate, Dr. F. D. Kern, who for ten years took part in the culture work. The grass and sedge rusts were, however, the ones that received the most extended and prolonged attention.

To carry on the work more than 2140 collections with resting spores were available, together with over 250 collections with spores not requiring a resting period. Tests of all of these, and of some many times repeated, showed that not all were viable, at least at the time tested, and therefore not serviceable. This material was provided in part by those directly connected with the work, and to a considerable extent by more than 85 botanical correspondents, many of whom contributed most generously in material and field observations year after year. Altogether about 3750 sowings, that is, attempts at cultures were made, of which about one in seven resulted in successful infection of the host. These tests were almost wholly made in a greenhouse, although a few were conducted in the open field when small plants suitable for placing in pots were not available.

It is difficult to say just how many species have been grown through some part of their life cycle during the nineteen-year period, owing to the constant shifting of accepted names as knowledge regarding them accumulated. Probably the list includes about one hundred species, as they are now rated, or nearly twice as many as they would at first have been listed, and of this number about eight were heteroecious to one autoecious. Of the heteroecious species some twenty were verifications of combinations previously established, mostly by European investigators, while about sixty-five provided alternate hosts for species whose life cycle was before unknown, most of these being grass and sedge forms not known outside of North America.

When viewing the present location of the New York Botanical Garden many years ago, it then being a rolling meadow without buildings of any kind, my companion, Professor L. M. Underwood, remarked that some day I might be called upon to supply the rust portion for the projected North American Flora, and added that if I did so he had no doubt that I would greatly reduce the number of species. The culture studies have enabled me to do this, but not quite in the way Professor Underwood

and others at that time had in mind. In many cases the first results have been to increase the number of species. Thus *Puccinia alternans* and *P. obliterata* were described as new species as result of cultures, but as the studies proceeded were reduced to synonyms of the long recognized *P. Agropyri,* together with *Aecidium Aquilegiae, A. Clematidis, Puccinia tomipara, P. Paniculariae,* and some others. But on the whole, as the cultures have largely dealt with heteroecious species, there has been a reduction in names as the alternate forms were brought together, and sometimes by the recognition as races of forms that were once thought distinct species.

The nomenclature of the reports has been made as conservative as possible, in order to give them reasonable uniformity. The new generic names proposed by the writer in 1906 at the Vienna Congress scarcely find an echo in them, while on the other hand the terminology for spore-forms, brought out in 1905, was put into use in the second report following, and proved highly serviceable.

In the various reports of the cultures, and as a result of them, the following thirteen specific names were transferred to other genera: *Aecidium magnatum* Arth. and *A. Silphii* Sydow to Uromyces, *Aecidium Ceanothi* Peck, *A. Impatientis* Schw., *A. Jamesianum* Peck, *A. macrosporum* Peck, *A. monoicum* Peck, *A. Pammelii* Trel., *A. Phrymae* Halst., *A. pustulata* Curt., *A. Sambuci* Schw. to Puccinia, and *Puccinia tumidipes* Peck and *P. Vernoniae* Berk. & Curt. to Bullaria.

Also as the result of the cultures the following sixteen species were described as new: *Gymnosporangium corniculans* Kern, *G. exterum* Arth. & Kern, *G. trachysorum* Kern, and on the authority of the writer *Puccinia albiperidia, P. alternans, P. Caricis-Asteris, P. Caricis-Erigerontis, P. Caricis-Solidaginis, P. Eatoniae, P. Koeleriae, P. obliterata, P. patruelis, P. universalis, Uromyces effusus, U. Solidagini-Caricis,* and *U. Steironematis,* but as the result of further studies most of these were subsequently buried in synonymy.

CORRECTIONS

In making corrections the consecutive page numbers used are those explained below at the beginning of the index, while the original pages are given in parentheses. A few of the corrections are typographical errors, or slips of the pen, but many are necessitated by information variously acquired after the reports were written and printed. Evident and inconsequential errors are not included. To save space the following abbreviations are used in the parentheses: B.G. for Botanical Gazette, J.M. for Journal of Mycology, and My. for Mycologia, and are followed by the original volume and page number.

Pages 5, 9 (B.G. **29**: *272*, *276*), under 7 and 3 respectively, for "Americana Lagh." and "Americana," read Andropogonis Schw. and Andropogonis, respectively, and for "Andropogi Schw." and "Andropogi," read Ellisiana Thüm. and Ellisiana, respectively.

Pages 7, 9, *22*, 28 (B.G. **29**: *274*, *276*; **35**: 16, *22*), for "K. & S.," read E. & K.

Pages 8, 31, 51, 60, 67, 75, 76, 77, 78, 83, 103, 106, 114, 127, 146, 156, 160, 164, 174 (B.G. **29**: *275*; J.M. **10**: 9; **11**: 57, 66; **12**: 16, 24, *25*, *26*, *27*; **13**: 192; **14**: 14, 17, *25*; My. **1**: *236*, *255*; **2**: *221*, *225*, *229*, *239*), for the species of Spartina, given as "cynosuroides" or "cynosuroides Willd.," read Michauxiana or Michauxiana Hitchc. The two species of grass were for a time confused and one name used for both.

Pages 11, 65, 77, 86, 94 (J.M. **8**: 52; **12**: 14, 26; **13**: 196, 204), for a species of Carex, for "tetanica" and "tetanica Schk.," read blanda and blanda Dewey, respectively.

Pages 17, 45, 49, 50, 60 (B.G. **35**: 11; J.M. **11**: 51, 55, 56, 66), for the species of Lepidium, given as "apetalum" and "apetalum Willd.," read densiflorum and densiflorum Schrad., respectively.

Page 26 (B.G. **35**: 20), the Aecidium mentioned under 5. P. AMPHIGENA was subsequently found not to be *A. Smilacis* Schw.

Pages 41, 42 (J.M. **10**: 19, 20). The supposed infection in 1903 of *Bromus ciliatus* by the application of aeciospores from *Dirca palustris* was the most serious error that occurred in the nineteen years of culture work. The grass used for the culture was undoubtedly infected before the sowing was made, as explained on pages 56 and 57 of the report following. The combination of aecia and telia under the name "*Puccinia hydnoidea*," was unwarranted. The *Aecidium hydnoideum* was under close observation during the whole culture period, and there were a score of attempts to find the alternate host, but even to the present writing no progress has been made.

Pages 49, 50 (J.M. **11**: 55, 56), under no. 4, for the species of Sophia from Nebraska, given as "incisa (Engelm.) Greene," read intermedia Rydb.

Pages 49, 60, 68, 77 (J.M. **11**: 55, 66; **12**: 17, 26), for the species of Sophia from Indiana used in the cultures, given as "incisa" and "incisa (Engelm.) Greene," read brachycarpa and brachycarpa Rydb.

Pages 51, 60, 67, 77, 103, 114, 127, 146, 160, 174, (J.M. 11: 57, 66; 12: 16, 26; 14: 14, 25; My. 1: 236, 255; 2: 225, 239), after Puccinia fraxinata, for "Schw.," read Link.

Page 62, first line of reprint, for "1," read 12.

Page 64 (J.M. 12: 13), under no. 6, for "Schw.," read Desmaz.

Pages 66, 77 (J.M. 12: 15, 26), under no. 7, for specific name "aquatilis" and "aquatilis Wahl.," read nebraskensis and nebraskensis Dewey. On page 66 the comparison of the large, thick-walled urediniospores (common on this host, the form being known as *Puccinia Garrettii* Arth.) to the amphispores of *P. Caricis-stictae* was an error. It may be pointed out here that the same mistake regarding name of the host also occurs in Sydow, Uredineen *2115*, Barth. Fungi Columb. *2351* and *3838*. *Carex nebraskensis* is a very common sedge about Denver and Boulder, Colo., while *C. aquatilis* is rare or possibly absent.

Pages 85, 92, 94 (J.M. 13: 195, 202, 204), under Lactuca, for "virosa," read scariola.

Pages 93, 95, 107, 114, 130, 146, 195, 201 (J.M. 13: 203, 205; 14: 18, 25; My. 1: 239, 255; 4: 26, 32), under Gymnosporangium, for "Nelsoni Arth.," read juvenescens Kern, and also delete the last sentence under no. 19 on page 107 (J.M. 14: 18). *Gymnosporangium Nelsoni* and *G. juvenescens* were for a time confused. Both produce aecia on Amelanchier and Sorbus, but the former gives rise to woody galls, often very small, while the latter is foliicolous.

Page 96, first line of the reprint for "1907," read 1908.

Pages 100, 180 (J.M. 14: 11; My. 4: 11), under Puccinia, for "montanensis Ellis," read Agropyri Ellis & Ev., as pointed out on page 263 (My. 8: 139).

Pages 109, 115 (J.M. 14: 20, 26), under no. 2, for "Cryptandri Ellis & Barth.," read substerilis Ellis & Ev., and for "Sporobolus cryptandrus (Torr.) A. Gray," read Stipa viridula Trin.

Pages 112, 115 (J.M. 14: 23, 26), under no. 6, for "mutabilis Ellis & Gall.," read Blasdalei Diet. & Holw., for "reticulatum Fraser," read Brandegei S. Wats., and for "recurvatum Rydb.," read cernuum Roth.

Page 123 (My. 1: 232), under no. 11, for "Aster arenarioides D. C. Eaton," read Erigeron arenarioides A. Gray.

Pages 129, 130, 146 (My. 1: 238, 239, 255), the small form of Gymnosporangium on Juniperus virginiana, which gave rise to pycnia and aecia on *Crataegus punctata*, should have been referred to *G. floriforme* Thaxter.

Page 133 (My. 1: 242), delete the entire paragraph beginning "The aecia of this species," etc., except the first sentence.

Page 147 (My. 1: 256), under no. 8, for "glomerata," read mexicana (L.).

Page 173 (My. 2: 238), under no. 1, change the reading thus: Teliospores on *Carex lanuginosa* Michx., sown on *Onagra biennis* (L.) Scop., and on *C. trichocarpa* Muhl. sown on *Gaura biennis* L.

Pages 178, 180 (My. 4: 9, 11), 19th and 6th line from bottom respectively, for "Douglasii," read spartioides.

Pages 180, 189, 197, 200, 231 (My. 4: 11, 20, 28, 31; 7: 72), as a species of Senecio, for "lugens" or "lugens A. Gray," read spartioides or spartioides T. & G., respectively.

Pages 197, 202 (My. 4: 28, 33), under no. 2, the material in hand from Isle au Haut, Me., was *Puc. quadriporula* (*P. Grossulariae*), but the results of infection were obtained from stray spores of *Uromyces perigynius,* as explained at page 235 (My. 7: 76) in the report of cultures for 1912.

Pages 256, 265 (My. 8: 132, 141), under no. 4, for "Agropyri E. & Ev. (P. alternans Arth)," read Cockerelliana Bethel. This distinctive species was not recognized, and had not been named until long after the cultures were made.

Pages 257, 265, (My. 8: 133, 141), under no. 5, for "Anchusa officinalis," read Lycopsis arvensis.

Pages 261, 263, 265 (My. 8: 137, 139, 141), under no. 3, for "montanensis Ellis" and "montanensis," read apocrypta Ellis & Tracy and apocrypta, respectively. On page 262 three species are confused. *Puccinia apocrypta* is not a synonym of *P. Agropyri.* The characters given for *P. apocrypta* are those of the true *P. montanensis,* for which the type is the collection cited.

Pages 274, 275 (My. 9: 302, 303), under no. 2, for "B. & C." read Schw.

SUMMARY OF CULTURES

In order to give a clearer perspective of the work, and to make the data more readily available, the following tabulation is given of the heteroecious species that were successfully grown on alternate hosts. Autoecious species, and heteroecious species grown from urediniospores or amphispores only, have not been included. The years are those in which successful cultures were carried out. Only such synonymy is given as will account for the names used at different times in the reports. The page numbers are those explained below at the beginning of the index. Pages in broad faced type indicate the host from which spores were taken for culture, while pages in common type indicate the host on which the culture was successfully established.

Year	Rust	Telial host	Aecial host
1904 1905	*Puc. Sorghi* Schw.	*Zea Mays* 59, 68	*Oxalis corniculata* (*O. cymosa*) 59, 68
1909	*Puc. Ceanothi* (E. & K.) Arth.	*Andropogon Hallii* 168	*Ceanothus americana* 168
1912	*Puc. Ellisiana* Thüm.	*Andropogon* sp. 230	*Viola cucullata* 230 *V. Nuttallii* 230
1899 1903 1906 1910	*Puc. Andropogonis* Schw. (*P. americana* Lagerh.)	*Andropogon scoparius* 5, 6, 33, 87, 186 *A. virginicus* 186	*Pentstemon hirsutus* (*P. pubescens*) 5, 6, 33, 87, 186 *P. alpinus* 186
1903 1905 1910	*Puc. pustulata* (Curt.) Arth.	*Andropogon furcatus* 39, 67, 186 *A. scoparius* 39	*Comandra umbellata* 39, 67, 186
1904 1905 1907	*Puc. Pammelii* (Trel.) Arth. (*P. Panici* Diet.)	*Panicum virgatum* 50, 67, 105	*Euphorbia corollata* 50, 67 *E. marginata* 105
1901 1904 1905 1906 1907 1909 1910 1916	*Puc. poculiformis* (Jacq.) Wettst. (*P. graminis* Pers.)	*Agropyron pseudorepens* 162 *A. repens* 51 *A. Smithii* 270 *A. tenerum* 51, 105, 187 *Agrostis alba* 68, 88, 187 *Avena sativa* 105 *Cinna arundinacea* 12 *Elymus canadensis* 51, 88, 270 *Hordeum vulgare* 88 *Sitanion longifolium* 162, 187 *Sporobolus cryptandrus* 270 *Triticum aestivum* (*T. vulgare*) 88, 162	*Berberis vulgaris* 12, 51, 68, 88, 105, 162, 187, 270
1917	*Puc. Majanthae* (Schum.) Arth.	*Phalaris arundinacea* 278	*Iris versicolor* 278
1904 1910 1912	*Puc. Stipae* Arth.	*Koeleria cristata* 189 *Stipa comata* 231 *S. spartea* 58, 188	*Aster ericoides* 58, 188 *A. multiflorus* 58, 188 *A. Novae-Angliae* 58, 188 *Grindelia squarrosa* 188 *Gutierrezia Sarothrae* 231 *Senecio spartioides* 189, 231 *Solidago canadensis* 188

Year	Rust	Telial host	Aecial host
1917	*Puc. Sporoboli* Arth.	*Sporobolus heterolepis* **280**	*Allium cernuum* 280 *A. Nuttallii* 280 *Lilium umbellatum* 280
1899 1902 1904 1905	*Puc. verbenicola* (E. & K.) Arth. (*P. Vilfae* Arth. & Holw.)	*Sporobolus longifolius* **7, 22, 50, 67**	*Verbena stricta* **7, 22** *V. urticifolia* 22, 50, 67
1902 1904 1905 1906 1907 1908 1909 1910 1911 1915 1916 1917	*Puc. subnitens* Diet.	*Distichlis spicata* **25, 49, 68, 87, 104, 126, 160, 188, 208, 259, 273, 278**	*Abronia fragrans* 273 *Atriplex hastata* 126, 160, 208 *Bursa Bursa-pastoris* 68, 104 *Chenopodium album* 25, 87, 104, 126, 160, 188, 208, 259, 278 *Cleome spinosa* 49, 208 *Erysimum asperum* 49, 68 *Lepidium densiflorum* (*L. apetalum*) 49 *L. virginicum* 49, 68 *Polygonum aviculare* 273 *Sarcobatus vermiculatus* 87, 126 *Sophia brachycarpa* 49, 68
1908 1909 1910 1914 1916	*Puc. Muhlenbergiae* Arth. & Holw. (*P. tosta* Arth.)	*Muhlenbergia gracillima* **271** *M. mexicana* **142** *M. racemosa* (*M. glomerata*) **161, 187** *Schedonnardus paniculatus* **272** *Sporobolus asperifolius* **240, 241**	*Callirhoe involucrata* 142, 161, 187 *Malvastrum coccineum* 271, 272 *Sphaeralcea digitata* 241 *S. incana* 240 *S. lobata* 241
1902 1903 1905 1907 1909 1910	*Puc. amphigena* Diet.	*Calamovilfa longifolia* **26, 33, 67, 104, 160, 187**	*Smilax herbacea* 26 *S. hispida* 26, 33, 67, 104, 160, 187
1911 1912	*Puc. monoica* (Peck) Arth.	*Koeleria cristata* 234 *Trisetum majus* 213 *T. subspicatum* 213, **234**	*Arabis* sp. **213, 234**
1904 1910 1916	*Puc. Rhamni* (Pers.) Wettst. (*P. coronata* Corda)	*Agrostis* sp. **271** *Avena sativa* 52 *Calamagrostis canadensis* **187**	*Rhamnus alnifolia* 187 *R. caroliniana* **52** *R. cathartica* **52** *R. lanceolata* **52** *R. Purshiana* 271

Year	Rust	Telial host	Aecial host
1899 1904 1905 1907 1908 1909	*Puc. fraxinata* (Link) Arth. (*P. peridermiospora* Arth.)	*Spartina Michauxiana* (not *S. cynosuroides*) **8, 51, 67, 103, 160** *S. polystachya* **127** *S. stricta* **127**	*Fraxinus lanceolata* (*F. viridis*) 8, 51, 67, 103, 127, 160
1915 1916	*Puc. Distichlidis* E. & E. (*P. Kelseyi* Syd.)	*Spartina Michauxiana* **261, 271**	*Steironema ciliatum* 261, 271
1905 1908 1910 1915	*Puc. Seymouriana* Arth.	*Spartina cynosuroides* **259** *S. Michauxiana* (not *S. cynosuroides*) **75, 127, 188, 258**	*Apocynum cannubinum* 258 *Asclepias syriaca* 259 *Cephalanthus occidentalis* 75, 127, 188
1902 1910	*Puc. Jamesiana* (Peck) Arth. (*P. Bartholomaei* Diet.)	*Bouteloua curtipendula* (*Atheropogon curtipendulus*) **24, 188**	*Asclepias incarnata* 24 *A. syriaca* 24, 188
1899 1907 1909 1911	*Puc. Phragmitis* (Schum.) Körn.	*Phragmites communis* (*P. Phragmites*) **2, 104, 160, 208**	*Rumex crispus* 2, 104, 160, 208 *R. obtusifolius* 2
1902 1907	*Puc. simillima* Arth.	*Phragmites communis* (*P. Phragmites*) **26, 104**	*Anemone canadensis* 26, 104
1899 1902 1904 1915	*Puc. Windsoriae* Schw.	*Tridens flavus* (*Triodia cuprea, Tricuspis seslerioides*) **6, 22, 50, 260**	*Ptelea trifoliata* **6**, 22, 50, 260
1903	*Puc. Eatoniae* Arth.	*Eatonia pennsylvanica* 40	*Ranunculus abortivus* **40**
1908	*Puc. Koeleriae* Arth.	*Koeleria cristata* **138**	*Mahonia Aquifolium* 138
1916	*Puc. Liatridis* (E. & A.) Bethel	*Koeleria cristata* **273**	*Laciniaria punctata* 273
1910	*Puc. Crandallii* Pam. & Hume	*Festuca confinis* **196**	*Symphoricarpos racemosus* 196
1915	*Puc. Cockerelliana* Bethel	*Festuca Thurberi* **256**	*Thalictrum dioicum* 256
1908 1915	*Puc. Asperifolii* (Pers.) Wettst.	*Secale cereale* **128, 257**	*Lycopsis arvensis* 128, 257
1915	*Puc. apocrypta* Ellis & Tracy	*Agropyron tenerum* 262 *Elymus virginicus* 262	*Hydrophyllum capitatum* **262**

Year	Rust	Telial host	Aecial host
1904 1906 1907 1908 1909 1911 1912 1914	*Puc. Clematidis* (DC.) Lagerh. (*P. Agropyri* E. & E., *P. tomipara* Trel., *P. cinerea* Arth. *P. alternans* Arth., *P. obliterata* Arth.)	*Agropyron biflorum* **140** *A. pseudorepens* **105** *A. Smithii* **232** *A.* sp. **161** *Bromus purgans* **87, 127** *B. ciliatus* **56** *B. Porteri* **139** *Elymus canadensis* **232** *E. virginicus* **242** *Puccinellia airoides* **137, 208**	*Anemone cylindrica* **232** *Aquilegia canadensis* 140, 161 *Clematis Drummondii* 242 *C. ligusticifolia* **232** *C. virginiana* 56, 87, 105, 127 *Oxygraphis Cymbalaria* (*Ranunculus Cymbalaria*) 137, 208 *Thalictrum alpinum* 161 *T. dioicum* 139 *Viorna Scottii* 105
1902 1903 1904 1909	*Puc. Impatientis* (Schw.) Arth.	*Elymus canadensis* 162 *E. striatus* **161**, 162 *E. virginicus* **25, 33, 51**, 162	*Impatiens aurea* **25, 33, 51, 161, 162**
1907	*Puc. obtecta* Peck	*Scirpus americanus* **109**	*Bidens connata* 109 *B. frondosa* 109
1899 1901 1904 1906 1907 1908 1910 1911 1912	*Puc. angustata* Peck	*Scirpus atrovirens* 6, **12, 52, 86, 103, 186, 230** *S. cyperinus* **125, 208**	*Lycopus americanus* **6, 12, 52, 86, 103, 186, 208, 230** *L. uniflorus* (*L. communis*) 125
1915	*Puc. Eriophori* Thüm.	*Eriophorum viridicarinatum* 255	*Senecio aureus* **255**
1905	*Puc. canaliculata* (Schw.) Lagerh.	*Cyperus esculentus* 74	*Xanthium "canadense"* **74**
1905 1906 1908	*Puc. Eleocharidis* Arth.	*Eleocharis palustris* **74, 87, 124**	*Eupatorium perfoliatum* 74, 87, 124
1908	*Puc. macrospora* (Peck) Arth.	*Carex comosa* **134**	*Smilax hispida* 134
1901 1903 1904 1905 1906 1907 1910 1912 1913 1915	*Puc. Grossulariae* (Pers.) Lagerh. (*P. albiperidia* Arth.)	*Carex arctata* **226, 254** *C. blanda* **65, 86** *C. crinita* **53, 86, 102, 226** *C. flexuosa* (*C. tenuis*) **182, 226, 254** *C. gracillima* **33, 53** *C. pallescens* **182** *C. pubescens* **12, 225** *C. squarrosa* **86** *C. sp.* **237**	*Ribes aureum* 53 *R. Cynosbati* 12, 33, 53, 86, 102, 182, 225, 226, 237, 254 *R. gracile* 65, 86 *R. rotundifolium* 53, 86 *R. uva-crispa* 33, 53

Year	Rust	Telial host	Aecial host
1901 1902 1905 1907 1909 1910	*Puc. Caricis* (Schum.) Schroet.	*Carex aristata* 158, 186 *C. nebraskensis* 66 *C. riparia* 22, 103 *C. stipata* 66, 103 *C. stricta* 11, 22, 186	*Urtica gracilis* 11, 22, 66, 103, 158, 186
1914	*Puc. minutissima* Arth.	*Carex filiformis* 245	*Decodon verticillatus* 245
1907 1909 1910 1916	*Puc. universalis* Arth.	*Carex filifolia* 270 *C. stenophylla* 110, 159, 185	*Artemisia dracunculoides* 110, 159, 185 *A. gnaphalodes* 270
1907	*Puc. Phrymae* (Halst.) Arth.	*Carex longirostris* 111	*Phryma leptostachya* 111
1901 1902 1904 1905 1907 1908 1909 1910 1912 1913 1914 1915	*Puc. Asterum* (Schw.) Kern (*P. extensicola* Plow., *P. Caricis-Asteris* Arth., *P. Caricis-Erigerontis* Arth., *P. Caricis-Solidaginis* Arth., *P. Dulichii* Syd.)	*Carex festiva* 159, 185 *C. festucacea* 13, 22, 52 *C. foenea* 13, 14, 21 *C. Jamesii* 27 *C. retrorsa* 228 *C. rosea* 102 *C. scoparia* 184, 228, 229 *C. sparganioides* 66, 124 *C. stipata* 27 *C.* sp. 102 *C. vulpinoidea* 238, 240 *Dulichium arundinaceum* 240, 254	*Aster adscendens* 159, 185 *A. cordifolius* 14, 102 *A. paniculatus* 13, 14, 21, 102, 228 *Erigeron annuus* 13, 22, 52 *E. philadelphicus* 22 *Euthamia graminifolia* 184, 229 *Leptilon canadense* 22 *Solidago caesia* 27 *S. canadensis* 27, 66, 124, 238, 240, 254 *S. glaberrima* 238 *S. mollis* 238 *S. rigida* 27 *S. rugosa* 238 *S. serotina* 27 *S. ulmifolia* 27
1902 1904 1905 1906 1908 1909 1910 1911	*Puc. Peckii* (DeT.) Kellerm.	*Carex lanuginosa* 52, 66, 85, 158, 184, 208 *C. stipata* 20, 124 *C. trichocarpa* 20, 21, 52, 85, 158, 184	*Gaura biennis* 158 *Meriolix serrulata* 184 *Onagra biennis* (*Oenothera biennis*) 20, 21, 52, 66, 85, 124, 158, 184, 208
1906 1908 1910	*Puc. patruelis* Arth. (*P. Opizii* Arth. not Bubák)	*Carex pratensis* 136 *C. siccata* 185 *C.* sp. 85	*Agoseris glauca* 136 *Lactuca canadensis* 85, 185 *L. sativa* 85, 185 *L. virosa* 85

Year	Rust	Telial host	Aecial host
1901 1902 1904 1905 1906 1908	*Puc. Sambuci* (Schw.) Arth. (*P. Atkinsoniana* Diet., *P. Bolleyana* Sacc.)	*Carex Frankii* **85** *C. lupulina* **65** *C. lurida* **21, 124** *C. trichocarpa* **14, 21, 52**	*Sambucus canadensis* **14, 21, 52, 65, 85, 124**
1904 1905	*Puc. Polygoni-amphibii* Pers.	*Polygonum emersum* 53, **69, 53**	*Geranium maculatum* **53, 69**
1910	*Puc. argentata* (Schultz) Wint.	*Impatiens aurea* 189	*Adoxa Moschatellina* **189**
1909	*Urom. Andropogonis* Tracy	*Andropogon virginicus* **163**	*Viola cucullata* 163
1902 1917	*Urom. seditiosus* Kern (*U. Aristidae* Auth. not E. & E.)	*Aristida basiramea* **279** *A. oligantha* **23**	*Plantago aristata* 279 *P. lanceolata* 279 *P. Rugelii* 23
1916	*Urom. Sporoboli* E. & E.	*Sporobolus virginaeflorus* 274	*Allium stellatum* **274**
1915	*Urom. Hordei* Tracy	*Hordeum pusillum* **263**	*Notholoscordium striatum* 263
1911	*Urom. Peckianus* Farl.	*Distichlis spicata* **209**	*Atriplex hastata* 209
1905 1907 1909 1910 1912 1917	*Urom. Polemonii* (Peck) Barth. (*U. acuminatus* Arth., *U. Spartinae* Farl., *U. Steironematis* Arth., *U. magnatus* Arth.)	*Spartina Michauxiana* **76, 106, 164, 198, 236, 282**	*Collomia linearis* 236 *Polemonium reptans* 198 *Polygonatum biflorum* 282 *P. commutatum* 282 *Steironema ciliatum* 76, 106, 164 *S. lanceolatum* 164 *Vagnera stellata* 282
1906 1907 1908 1914	*Urom. Scirpi* (Cast.) Burr.	*Scirpus fluviatilis* **89, 106, 128, 242**	*Cicuta maculata* 89, 106, 128 *Sium cicutaefolium* 242
1903 1910 1912 1914 1917	*Urom. perigynius* Halst. (*U. Solidaginis-Caricis* Arth.)	*Carex deflexa* **190** *C. intumescens* **190, 234** *C. sparganioides* **279** *C. tribuloides* **242** *C. varia* **37**	*Aster ericoides* 190 *A. paniculatus* 190, 234 *A. Tweedyi* 242 *Rudbeckia laciniata* 279 *Solidago caesia* 37 *S. canadensis* 37, 234 *S. flexicaulis* 37 *S. serotina* 37 *S. rugosa* 190

Year	Rust	Telial host	Aecial host
1910 1912	*Urom. Junci* (Desm.) Tul.	*Juncus balticus* **191, 236**	*Ambrosia artemisiaefolia* 191 *A. psilostachya* 191 *A. trifida* 191 *Caduus Flodmanii* 191, 236
1906 1907	*Urom. Silphii* (Syd.) Arth.	*Juncus tenuis* **92, 106**	*Silphium perfoliatum* 92, 106
1908	*Urom. houstoniatus* (Schw.) Sheldon	*Sisyrinchium gramineum* 129	*Houstonia caerulea* **129**
1908 1911	*Gym. Libocedri* (P. Henn.) Kern	*Libocedrus decurrens* **143, 211**	*Amelanchier vulgaris* 211 *Crataegus cerronis* 211 *C. Pringlei* 143 *C. tomentosa* 211
1907 1911	*Gym. inconspicuum* Kern	*Juniperus utahensis* **113, 211**	*Amelanchier erecta* 113 *A. vulgaris* 211
1909	*Gym. exiguum* Kern	*Juniperus virginiana* **169**	*Crataegus Pringlei* 169
1908 1910	*Gym. Davisii* Kern	*Juniperus sibirica* **132, 194**	*Aronia arbutifolia* 194 *A. nigra* 132, 194
1906 1907 1908 1910	*Gym. juvenescens* Kern	*Juniperus scopulorum* **93, 107, 130** *J. virginiana* **195**	*Amelanchier canadensis* 93, 107 *A. erecta* 107, 130, 195 *A. intermedia* (*A. Botryapium*) 107 *Sorbus americana* 93, 107, 130
1911	*Gym. Kernianum* Bethel	*Juniperus utahensis* **216**	*Amelanchier vulgaris* 216
1909	*Gym. trachysorum* Kern	*Juniperus virginiana* **172**	*Crataegus cerronis* 172 *C. coccinea* 172 *C. punctata* 172
1908 1914	*Gym. Botryapites* (Schw.) Kern	*Chamaecyparis thyoides* **131, 242, 243**	*Amelanchier canadensis* 242, 243 *A. intermedia* 131
1907 1909 1910 1911 1914	*Gym. nidus-avis* Thax.	*Juniperus virginiana* **108, 129, 165, 194, 210, 242**	*Amelanchier erecta* 210 *A. vulgaris* 194, 242 *Crataegus Pringlei* 165 *Cydonia vulgaris* 194 *Malus coronaria* 129, 210 *M. Malus* 108, 129 *M. ioensis* 165

Year	Rust	Telial host	Aecial host
1907 1908 1909 1910	*Gym. clavipes* C. & P.	*Juniperus sibirica* **107, 164, 193** *J. virginiana* **130**	*Amelanchier erecta* 107, 164, **193** *A. intermedia* 107 *Crataegus punctata* 164 *C. tomentosa* 193 *C.* sp. 130
1908 1909 1910	*Gym. cornutum* (Pers.) Arth.	*Juniperus sibirica* **131, 165, 194**	*Sorbus americana* 131, 165, 194 *S. aucuparia* 165
1908 1909	*Gym. exterum* Arth. & Kern	*Juniperus virginiana* **144, 166**	*Porteranthus stipulatus* 144, 166
1911	*Gym. juniperinum* (L.) Mart. (*G. tremeloides* Hartig)	*Juniperus sibirica* **211**	*Sorbus americana* 211
1911 1912	*Gym. gracilens* (Peck) Kern & Bethel	*Juniperus monosperma* **217** *J. utahensis* **237**	*Philadelphus coronarius* 217, 237 *P. Keteleerii* 237
1911	*Gym. effusum* Kern	*Juniperus virginiana* **217**	*Aronia arbutifolia* 217
1907 1908 1910 1911 1913	*Gym. clavariaeforme* (Jacq.) DC.	*Juniperus sibirica* **108, 130, 194, 210, 238**	*Amelanchier erecta* 130, 194, 210 *A. intermedia* 108 *Crataegus cerronis* 238 *C. punctata* 194
1914	*Gym. Ellisii* (Berk.) Farl.	*Chamaecyparis thyoides* **246**	*Myrica cerifera* 246
1907 1908 1909 1910 1912	*Gym. Betheli* Kern	*Juniperus scopulorum* **112, 113, 131, 165, 195, 237**	*Crataegus cerronis* 165, 195 *C. coccinea* 112 *C. cordata* 113 *C. Pringlei* 237 *C. punctata* 112 *C.* sp. 131 *Sorbus americana* 112, 113, 131
1906 1907 1908 1909	*Gym. globosum* Farl.	*Juniperus virginiana* **90, 107, 130, 164**	*Crataegus coccinea* 164 *C. Pringlei* 90, 130 *Malus coronaria* 90 *M. Malus* (*Pyrus Malus*) 107 *Sorbus americana* 90
1911 1912	*Gym. Nelsoni* Arth.	*Juniperus scopulorum* **237** *J. utahensis* **215**	*Amelanchier canadensis* 237 *A. vulgaris* 215

Year	Rust	Telial host	Aecial host
1909	*Gym. corniculans* Kern	*Juniperus horizontalis* 170	*Amelanchier canadensis* 170 *A. erecta* 170
1908 1909	*Gym. floriforme* Thax.	*Juniperus virginiana* 129, 166	*Crataegus coccinea* 166 *C. punctata* 129
1905 1906 1907 1908 1910	*Gym. Juniperi-virginianae* Schw.	*Juniperus virginiana* 64, 90, 106, 129, 193	*Malus coronaria* 90, 129 *M. Malus* (*Pyrus Malus*) 64, 106, 129, 193
1905 1906	*Tranz. punctata* (Pers.) Arth. (*Puc. Pruni-spinosae* Pers.)	*Prunus pumila* 89 *P. serotina* 71, 89	*Hepatica acutiloba* 71, 89
1903 1904 1905 1908	*Mel. Medusae* Thüm.	*Populus deltoides* 35, 46, 64 *P. tremuloides* 47, 133	*Larix decidua* 35, 46, 47, 64 *L. laricina* 46, 64, 133
1910 1911	*Mel. albertensis* Arth.	*Populus tremuloides* 198, 212	*Pseudotsuga mucronata* 198, 212
1904 1906	*Mel. Bigelowii* Thüm.	*Salix amygdaloides* 54 *Salix* sp. 84	*Larix decidua* 54, 84
1910	*Mel'sis abietina* (A. & S.) Arth.	*Ledum groenlandicum* 195	*Picea mariana* 195
1910	*Mel'ella elatina* (A. & S.) Arth.	*Cerastium oreophilum* 212	*Abies lasiocarpa* 212
1909	*Calyp. columnaris* (A. & S.) Körn.	*Vaccinium pennsylvanicum* 166	*Abies Fraseri* 166
1906 1910 1913	*Cron. Quercus* (Brond.) Schroet.	*Quercus Phellos* 238 *Q. rubra* 195, 238 *Q. velutina* 84	*Pinus virginiana* 84, 195 *P. taeda* 238
1910 1911 1913 1914	*Coleos. Vernoniae* B. & C.	*Vernonia crinita* 198 *V. fasciculata* 239, 243 *V. gigantea* 211	*Pinus pulustris* 239 *P. taeda* 198, 211, 239, 243

INDEX

A consecutive paging of the reports has been adopted in order to simplify the index. It corresponds to the original paging as follows:

Pages 1–9 (Botanical Gazette **29**: 268–276).
" 10–15 (Journal of Mycology 8: 51–56).
" 16–29 (Botanical Gazette **35**: 10–23).
" 30–43 (Journal of Mycology **10**: 8–21).
" 44–61 (Journal of Mycology **11**: 50–67).
" 62–78 (Journal of Mycology **12**: 11–27).
" 79–95 (Journal of Mycology **13**: 189–205).
" 96–115 (Journal of Mycology **14**: 7–26).
" 116–147 (Mycologia **1**: 225–256).
" 148–175 (Mycologia **2**: 213–240).
" 176–202 (Mycologia **4**: 7–33).
" 203–219 (Mycologia **4**: 49–65).
" 220–248 (Mycologia **7**: 61–89).
" 249–265 (Mycologia **8**: 125–141).
" 266–284 (Mycologia **9**: 294–312).
" 285–296 (Mycologia **13**: 12–23).
" 279–329 (Mycologia **13**: 230–262).

Names in *italics* are synonyms.

Numbers in broad-faced type indicate successful cultures.

Numbers in square brackets refer to pages (1) where the common name is used for the species instead of the Latin name, or (2) where the name occurs but is not the species intended and not a synonym (*e.g., Anchusa officinalis* for *Lycopsis arvensis*), or (3) where the name does not occur but some other name not a synonym (the error being due to wrong identification, *e.g., Gymnosporangium Nelsoni* used for *G. juvenescens,* or to common but erroneous usage, *e.g., Spartina cynosuroides* for *S. Michauxiana*).

FUNGUS INDEX

Aecidium *abundans* (Puc. Crandallii) 197
albiperidium (Puc. Grossulariae) 12, 15
alliicolum (Urom. Sporoboli) **273**, 275
Asterum (Puc. extensicola) 13, 15
Berberidis (Puc. poculiformis) 15
Blasdaleanum (Gym. Libocedri) 143
Calystegiae (Puc. Convolvuli) 9
Ceanothi (Puc. Ceanothi) 168
Cephalanthi (Puc. . Seymouriana) 75
Clematidis or *Clematitis* (Puc. Agropyri) 57
compositarum Silphii (Urom. Silphii) 92
cornutum (Gym. cornutum) 132
Dracunculi (Puc. universalis) 110
elatinum (Melampsorella elatina) 212
erigeronatum (Puc. extensicola) 13, 15
Euphorbiae (Urom. Euphorbiae) 9, 15
Fraxini (Puc. fraxinata) **8**, 9
fumariaceum (Puc. subnitens) 278
hepaticatum (Puc. Pruni-spinosae) 71
houstoniatum (Urom. houstoniatus) **128**
Hydrophylli (Puc. apocrypta) **262**, 265
hynoideum 41
Impatientis (Puc. Impatientis) **24**
Iridis (Puc. Majanthae) 253
Jamesianum (Puc. Jamesiana) **24**
leucospermum (Urom. Lespedezaeprocumbentis) **36**
Liatridis (Puc. Liatridis) 273
Lycopi (Puc. angustata) **6**, 9, 15
macrosporum (Puc. macrospora) 135
magnatum (Urom. magnatus) 282
malvicola (Puc. Muhlenbergiae) 272
monoicum (Puc. monoica) **213**
Napaeae (Puc. Muhlenbergiae) 142
Nesaeae (Puc. minutissima) 245
obesum (Puc. Seymouriana) 258, 265
occidentale (Puc. Agropyri) 57
Oxalidis (Puc. Sorghi) **59**
Pammelii (Puc. Pammelii) **50**
Peckii (Puc. Peckii) 19
Pentstemonis (Puc. Andropogonis) **5**, 9
Phrymae (Puc. Phrymae) 111
Polemonii (Urom. acuminatus) 198
Pteleae (Puc. Windsoriae) **6**, 9, **22**
punctatum (Puc. Pruni-spinosae) 70
pustulatum (Puc. pustulata) **39**
Ranunculi (Puc. Eatoniae) **40**
rubellum (Puc. Phragmitis) 3, 9
Sambuci (Puc. Sambuci) **14**, 15, 20
sanguinolentum (Puc. Polygoni-amphibii) 32, **53**, 69
sclerothecioides (Puc. Stipae) 189
Silphii (Urom. Silphii) 92
Solidaginis (Puc. extensicola) **27**
Urticae (Puc. Caricis) **3**, 9, 15
verbenicola (Puc. verbenicola) **7**, 9, **22**
Bullaria tumidipes 260
Vernoniae 274
Caeoma *erigeronatum* (Puc. extensicola) 13
miniata (Phrag. speciosum) 4, 9
occidentale (Melampsora albertensis) 199
Ulmariae (Triphragmium Ulmariae) 9
Calyptospora columnaris **166**, 175
Coleosporium Campanulae 46
Vernoniae **198**, 202, **211**, 219, **239**, **243**, 248
Cronartium Quercus **84**, 94, **195**, 202, **239**, 248
Gymnoconia interstitialis 207

Gymnosporangium Betheli **112,** 115, 131, 147, **165,** 174, **194,** 201, **237,** 247
biseptatum (G. Botryapites) 131
Botryapites **131,** 147, **242,** 248
clavariaeforme **108,** 115, **130,** 146, **193,** 201, **210,** 218, **238,** 247
clavipes **107,** 115, **130,** 146, **164,** 174, **193,** 201
corniculans **170,** 171, 175
cornutum **131,** 147, **165,** 174, **194,** 201
Davisii **132,** 147, 151, **194,** 201
durum (G. Nelsoni) 215, 219, 237, 247
effusum **216,** 219
Ellisii **245,** 248
exiguum **169,** 175
exterum **144,** 147, **166,** 175
floriforme [129], [146], **166,** 174
globosum **90,** 95, **107,** 114, **130,** 146, **164,** 174
gracilens **217,** 219, **237,** 247
inconspicuum **113,** 115, **211,** 218
juniperinum **211,** 219
Juniperi-virginianae **64,** 77, **90,** 95, **106,** 114, **129,** 146, **193,** 201
juvenescens [93], [95], [107], [114], [130], [146], [195], [201], 216
Kernianum **216,** 219
Libocedri **143,** 147, **211,** 219
macropus (G. Juniperi-virginianae) 65
Nelsoni [93], [95], [107], [114], [130], [146], [195], [201], **215,** 219, **237,** 247
Nidus-avis **108,** 115, **165,** 174, **194,** 201, **210,** 218, **242,** 248
speciosum (G. gracilens) 217
trachysorum **172,** 175
tremelloides (G. juniperinum) 132, 211, 219
Lecythea *macrosora* (Mel. Bigelowii) 55
Melampsora albertensis **198,** 202, **212,** 219
Bigelowii **54,** 61, **84,** 94
Lini **91,** 95
Medusae **35,** 42, **46,** 60, **64,** 77, **133,** 147
paradoxa (M. Bigelowii) 55
Melampsorella elatina **212,** 219
Melampsoropsis abietina **195,** 202
Nigredo Polemonii 282
Peridermium *carneum* (Coleos. Vernoniae) **198,** 211, **239,** 243
Cerebrum (Cronart. Quercus) **84,** 195
fusiforme (Cronart. Quercus) **238,** 248
Phragmidium speciosum **4,** 9, **23,** 28, **47,** 60, **106,** 114
Puccinia Absinthii **134,** 147, **190,** 201
Agropyri [100], **104,** 114, **232,** 241, 247, 252, [256], [265], **276,** 292, 293
albiperidia (P. Grossulariae) **12,** 15, **33,** 42, **52,** 61, **65,** 77, **86,** 94, **102,** 113, 184, 226, 227, **237,** 246, 290
alternans (P. Agropyri) **139,** 147, [256], [265], 293
americana (error for P. Andropogonis) [5], [9]
amphigena **26,** 29, **33,** 42, **67,** 77, **104,** 114, **160,** 173, **187,** 200, 250
Andropogonis [5], [9], **33,** 42, **87,** 94, **186,** 200
angustata **6,** 9, **12,** 15, **52,** 61, **86,** 94, **103,** 114, **125,** 146, **186,** 200, **208,** 218, **229,** 247
Anthoxanthi 180
apocrypta (partly error for P. montanensis) [261], 262, [263], [265]
argentata **189,** 201
Arundinariae 100
Asperifolii **127,** 146, **257,** 265
Asteris 123
Asterum 288
Atkinsoniana (P. Sambuci) 11, 20, 21
Bartholomaei (P. Jamesiana) **24**
Blasdalei [112], [115]
Bolleyana (P. Sambuci) **14,** 15, **20,** 21, **52**
canaliculata **74,** 78

caricina 11, 293
Caricis **3**, 9, **11**, 15, **22**, 28, **66**, 77, 103, 113, **158**, 173, **186**, 200, 293
Caricis-Asteris (P. extensicola) **13**, 15, **21**, 28, **102**, 113, **159**, 173, **185**, 197, 199, **228**, 246, 287
Caricis-Erigerontis (P. extensicola) **12**, 15, **21**, 28, **52**, 61, 287
Caricis-Solidaginis (P. extensicola) **27**, 29, **66**, 77, **124**, 146, **184**, 199, **228**, 246, 287
Caricis-strictae 66
caulicola **36**, 42
Ceanothi **168**, 175
Chloridis 18
cinerea (P. Agropyri) **137**, 147, **208**, 218, 292, 293
Clematidis 293
Cockerelliana [256], [265]
Convolvuli **3**, 9
Crandallii 64, 100, **196**, 202
Cryptandri [109], [115], 223, 280
Distichlidis 154, 180, **260**, 265, **271**, 275, 291
Dulichii (P. extensicola) 121, **240**, 246, **254**, 264
Eatoniae **40**, 42, 295
Eleocharidis 17, **74**, 78, **87**, 94, **124**, 146
Ellisiana 99, 122, 155, 178, **230**, 247
emaculata 11, 18, 32, 63, 82, 100, 121, 224, 251, 276
Eriophori **255**, 265
exitiosa (P. transformans) **73**
extensicola **229**, **238**, **239**, 246, **254**, 264, 288, 289
fraxinata **51**, 60, **67**, 77, **103**, 114, **127**, 146, **160**, 174
graminis (P. poculiformis) 295, 296
Grindeliae **72**, 78
Grossulariae **182**, 199, **225**, 246, **254**, 265, 290
Helianthi **23**, 28, **34**, 42, **47**, 60, **69**, 78, 287
hydnoidea (error) 41, 42, 57
Impatientis **25**, 29, **33**, 42, **51**, 60, **161**, 174, 292
Isiacae 294
Jamesiana **24**, 28, **188**, 200
Koeleriae **138**, 147
Kuhniae **74**, 78, **124**, 145
lateripes **69**, 78, 294
Liatridis **273**, 275, 292
Lithospermi **197**, 202
ludibunda 46
Lygodesmiae **212**, 219
macrospora **135**, 147
Majanthae **277**, 284
McClatchieana 223
minutissima **245**, 248
monoica **215**, 219, **234**, 247
montanensis (partly error for P. apocrypta) [100], [180], [261], 262, [263], [265]
Muhlenbergiae 17, **142**, 147, **161**, 174, **187**, 200, **241**, 247, **271**, 275
mutabilis [112], [115]
nigrescens (P. caulicola) 37
nodosa **244**, 248
obliterata (P. Agropyri) **141**, 147, **160**, 174, 293
obtecta **109**, 115
Opizii (P. patruelis) **84**, 94, **185**, 200
Pammelii **50**, 60, **67**, 77, **105**, 114
Panici (P. Pammelii) **50**
Panicullariae (P. Agropyri) 18
patruelis **136**, 147
Peckii 11, **19**, 28, **52**, 61, **66**, 77, **85**, 94, **124**, 145, **157**, 173, **184**, 199, **208**, 218
peridermiospora (P. fraxinata) **8**, 9
perminuta (P. Impatientis) 178
Phragmitis **2**, 9, **104**, 114, **160**, 174, **208**, 218
Phrymae **111**, 115
poculiformis **12**, 15, **51**, 61, **68**, 77, **88**, 94, **105**, 114, 122, **162**, 174, **187**, 200, **270**, 275
Podophylli **59**, 61
Polygoni-amphibii 18, 31, **53**, 61, **69**, 78, 82
Pruni-spinosae (Tranzschelia punctata) **70**, 78, **89**, 94
purpurea 18
pustulata **40**, 42, **67**, 77, **186**, 200

quadriporula (P. Grossulariae) 197, 202, 235, 246
quadriporula (error for Urom. perigynius) [197], [202], 235
Rhamni **52,** 61, **187,** 200, 252, **271,** 275
Ribesii-Caricis (P. Grossulariae) 228
rubigo-vera 11, 128, 154, 291, 293
Ruelliae 294
Salviae-lanceolatae (P. caulicola) 37
Sambuci **21,** 28, **52, 65,** 77, **85,** 94, **124,** 146
Schedonnardi (P. Muhlenbergiae) 17, 82, 100, 122, 179, 207, **271,** 275
Seymouriana **75,** 78, **127,** 146, **188,** 200, 249, **258,** 265
Silphii **72,** 78, **88,** 94
simillima **26,** 29, **104,** 114, 251
Solidaginis **73,** 78
Sorghi **59,** 61, **68,** 78
Sporoboli 18, **279,** 284
splendens **244,** 248
Stipae 18, **57,** 59, 61, **188,** 200, **231,** 247
striatula (P. Majanthae) 154
subnitens **25,** 29, **48,** 60, **67,** 77, **87,** 94, **104,** 114, **125,** 146, **160,** 173, **187,** 200, **208,** 209, 218, **259,** 265, **272,** 275, **278,** 284, 289, 293, 294
substerilis **75,** 78, **[109],** [115], 154, **163,** 174
Sydowiana (P. verbenicola) **7**
tenuistipes 102
tomipara (P. Agropyri) [41], **56,** 61, **87,** 94, **127,** 146, 233, 293
tosta (P. Muhlenbergiae) **32,** 63, 179, 206, **240,** 247
transformans **73,** 78, **88,** 94
triticina (P. Agropyri) 276, 292, 293
tumidipes **260,** 265
uniporula (P. Grossulariae) 226, 227, **254,** 265
universalis **110,** 115, **159,** 173, **185,** 200, **270,** 275
verbenicola [7], [9], **22,** 28, **50,** 60, **67,** 77
Vernoniae **274,** 275
vexans 32, **109,** 115, 122
Vilfae (P. verbenicola) **7,** 9, **22**
virgata 99, 154, 179
vulpinoidis (P. extensicola) 120, **238,** 246, 288
Windsoriae **6,** 9, **22,** 28, **50,** 60, **259,** 265
Xanthii **71,** 78, **88,** 94
Pucciniastrum Hydrangeae 277
Roestelia *Betheli* (Gym. Betheli) 113
cornuta (Gym. cornutum) 118, 150
Harknessianoides (Gym. inconspicuum) 113
hyalina (Gym. hyalinum) 150
penicillata (Gym. juniperinum) 118, 132
Tranzschelia punctata (*Puc. Prunispinosae*) 139
Tremella *juniperina* (Gym. juniperinum) 132
Triphragmium Ulmariae **4,** 9
Uredo *Oxytropi* (Urom. Astragali) 192
rubigo-vera (Puc. Agropyri) **19,** 28
Uromyces acuminatus 31, **75,** 78, 83, **106,** 114, 156, **198,** 202, **236,** 247, 283
Andropogonis 123, **163,** 174
Archerianus 253
Aristidae (U. seditiosus) **23,** 28
Astragali **192,** 201
Caricis (Puc. Caricis-strictae) 66
effusus 83, 93
elegans **244,** 248
Eleocharidis 83, 181
Euphorbiae **3,** 9, **10,** 15, **18,** 28, 287
graminicola 64, 123, 155, 181, 269
Halstedii 17
Hordei **263,** 265
houstoniatus **128,** 146
Junci 17, 64, 93, 101, 155, **191,** 201, **235,** 247
Lespedezae-procumbentis **36,** 42
magnatus **283,** 284

Medicaginis **193,** 201, **210,** 218
Murrilli (U. houstoniatus) 128
Orobi 101
Peckianus 181, **209,** 218, 289
perigynius 38, **190,** [197], 201, **234, 242,** 247, **279,** 284, 288, 293
Phaseoli **36,** 42
Polemonii 282, 291
Rhyncosporae 101, 224
Scirpi **89,** 94, **106,** 114, **128,** 146, **242,** 247, 253
seditiosus **278,** 284
Silphii **92,** 93, 95, **106,** 114
Solidagini-Caricis (U. perigynius) **38,** 42
Spartinae **164,** 174, 181, 283
Sporoboli 17, 182, 225, **273,** 275, 280
Steironematis 283
uniporulus 183, 291

HOST INDEX

Abies alba 167
balsamea 17, 167, 277
concolor 167, 277
Fraseri **166,** 167, 175
lasiocarpa **212,** 219
magnifica 167
nobilis 167
Abronia fragrans 155, **273,** 275, 278
umbellata 121, 223
Actaea alba 46, 51, 81, 82, 99, 122, 154, 162, 178, 223
rubra 81
Adelia acuminata 51, 67
ligustrina 51, 127
segregata 51, 127
Adoxa moschatellina **189,** 201
Aesculus glabra 18, 63, 81, 98, 99, 100, 101, 155, 180, 181, 206, 207, 224
Agoseris glauca **136,** 147, 159
Agropyron biflorum **140,** 142, 147
caninum 142
glaucum 276
pseudorepens **105,** 114, **162,** 174
repens **51,** 61, 101, 163
Smithii **232,** 247, **270,** 275, 276
sp. **105, 160,** 174
tenerum **51,** 61, **105,** 114, 163, **187,** 200, **262,** 265
Agrostis alba **68,** 77, **88,** 94, 163, **187,** 200
hyemalis 178
perennans 178
sp. **271,** 275
Allium Brandegei [112], [115]
canadense 274, 280
cernuum [112], [115], **280,** 284
Nuttallii **280,** 284
recurvatum [112], [115]
reticulatum [112], [115] 225, 274
stellatum **273,** 275, 278, 280
Althaea rosea 81, 82, 123, 155, 161, 187
Ambrosia artemisiaefolia 63, 76, 92, 236
psilostachya 192, 235, **236,** 247
trifida 6, 11, 25, 32, 45, 65, 71, 81, 82, 92, 101, 120, 121, 122, 134, 153, 154, 168, 180, 191, **236,** 247
Amelanchier *Botryapium* 65, 107, 133
canadensis **93,** 95, 101, **107,** 108, 109, 113, 114, 143, 165, 169, **170,** 171, 175, 217, **237, 242, 243,** 247, 248
erecta **107, 113,** 114, 115, **130, 132,** 146, 157, **164,** 165, **170,** 171, 174, 175, **194, 195,** 201, 207, **210,** 211, 216, 217, 218
intermedia **107, 108,** 114, 115, **131,** 147, 171
sp. 90
vulgaris 133, **194,** 201, **211, 215,** 216, 217, 218, 219, **242,** 248
Amorpha fruticosa 121, 179, 181
nana 168, 179, 180, 182
Amsonia salicifolia 243, 258
Amygdalis communis 70
persica 71, 89
Anchusa officinalis [257], [265]
Andropogon furcatus 6, **39,** 42, **67,** 77, **186,** 200
glomeratus 123, 155

Hallii **168,** 169, 175
scoparius **5, 6, 33, 39,** 42, **87, 94,** 99, 122, 155, 178, **186,** 200
sp. **186, 230,** 247
virginicus **163,** 174, **186,** 200
Anemone canadensis 17, 19, **26, 29,** 64, **104,** 114, 252
coronaria 70
cylindrica 26, **232,** 247, 251, 252, 256, 276
pennsylvanica 32
ranunculoides 71
virginiana 17, 26, 81, 104, 122
Anemonella thalictroides 81, 82, 98, 178
Anthoxanthum odoratum 180
Apios Apios (*A. tuberosa*) 46, 81, 82, 123, 179, 181, 225
Apocynum cannabinum 17, 24, 32, 101, 122, 153, 178, 179, 180, 181, 182, 197, 224, **258,** 265
hypericifolium 258
Aquilegia caerulea 101, 141, 232
canadensis 64, **140,** 147, 178, 242, 256
elegantula 141
flavescens 141, 232, 242
formosa 141
sp. 252
truncata 141
Arabis Drummondii 214
Holboellii 120, 154, 159, 179, 180, 189
retrofracta 215
sp. 99, 101, **213, 214,** 219, **234,** 247
Aragallus Lamberti **192,** 201
Arisaema triphyllum 91
Aristida basiramea **279,** 284
oligantha **23,** 28
ramosissima 279
Arnica sp. 155, 179, 180, 182, 189, 191, 196
Aronia arbutifolia 108, 157, **194,** 201, **217,** 219, 242
nigra 93, 130, **132,** 147, 165, **194,** 201
rotundifolia 133
Artemisia canadensis 111
dracunculoides 99, **110,** 111, 115, 121, **134,** 147, 154, **159,** 173, **185, 190,** 200, 201, 269
dracunculus 110, 111
frigida 111
gnaphalodes **270,** 275
kansana 111
longifolia 159
ludoviciana 190
serrata 99
sp. **190,** 201
Arundinaria macrosperma 100
Asclepias incarnata **24,** 28, 45
pulchra 258
syriaca **24,** 28, **188,** 200, 258, **259,** 265
verticillata 225
Asclepiodora decumbens 24
Asprella Hystrix 262
Aster adscendens **159,** 173, **185,** 199
arenarioides [123]
cordifolius 11, 13, **14,** 58, **102,** 113
Drummondii 32, 58, 66, 121, 123, **124,** 153, 178, 190, 238, 240, 242
ericoides 32, **58,** 59, 61, 75, 154, **188, 190,** 200, 201, 231
lateriflorus 279
multiflorus 57, **58,** 59, 61, 75, 123, 153, 154, **188,** 200, 231
Novae-Angliae **58,** 59, 61, 75, **188,** 200, 231
paniculatus 11, 12, **13, 14,** 19, 20, 21, 28, 32, 58, 66, 100, **102,** 111, 113, 120, 121, 123, 124, 153, 179, 182, 184, **190,** 197, 201, 202, 224, **228,** 229, 234, 235, 238, 240, 242, 243, 246, 247, 254
prenanthoides 20, 32
sericeus 58
Shortii 19
Tripoli 229
Tweedyi 153, **159, 185,** 240, **242,** 247
Astragalus canadensis 182
carolinianus **192,** 201
sulphurescens **192,** 201
Atheropogon curtipendulus **24,** 28, **109,** 115, 122, **188,** 200

Atriplex confertifolia 206
hastata **126**, 146, **160**, 173, **208**, **209**, 218, 289
Avena sativa **52**, 61, 88, **105**, 114, 163
Baptisia bracteata 225
leucantha 110
tinctoria 45, 142, 155, 168
Berberis *Aquifolium* 138
repens 138
vulgaris **12**, **51**, 61, **68**, 77, **88**, 94, **105**, 114, 122, 138, **162**, 174, 180, **187**, 200, **270**, **271**, 275
Berula angustifolia 89
Bidens connata **109**, 115
frondosa 17, 101, **109**, 110, 115
Boehmeria cylindrica 153, 158, 162, 168, 179, 186, 197
Boltonia asteroides 18, 32, 81, 99, 121, 179, 181, 189, 269, 270
Bouteloua curtipendula (see Atheropogon) **24**, 32
racemosa **109**, 122
Brauneria purpurea 18
Brodiaea pauciflora **244**, 248
Bromus ciliatus 11, 19, 41, 42, **56**, 57, 61, 276
Porteri **139**, 140, 147
Pumpellianus 139, 140
purgans 57, **87**, 94, **127**, 146
Richardsoni 140
Bursa bursa-pastoris **68**, 77, 87, 100, **104**, 114, 209
Cacalia reniformis 81, 120, 121, 123
Calamagrostis canadensis 154, **187**, 200
Calamovilfa longifolia **26**, 29, **33**, 42, **67**, 77, **104**, 114, **160**, 173, **187**, 200, 250
Callirhoe digitata 223, 224, 240, 241
involucrata 32, 81, 82, 83, 120, 123, **142**, 147, 154, 155, **161**, 174, **187**, 200, 207, 224, 240, 241
Callistephus hortensis 123
Campanula americana 46
Campsis radicans 73
Capnoides montanum 277, 278
Cardamine bulbosa 100, 126
Carduus Flodmanii 180, **191**, **192**, 201, **236**, 247
undulatus 154, 158, 168
Carex aquatilis (error for C. nebraskensis) [66], [77]
arctata 178, **226**, 246, **254**, 265
aristata **158**, 173, **186**, 200
Backii 153, 269
blanda (see tetanica)
Bonplandii minor 153
brunnescens 197
cephalophora 3
comosa 119, **134**, 136, 147
crinita **53**, 61, **86**, 94, **102**, 113, **226**, 246
deflexa **190**, 191, 201
Douglasii 99
durifolia 255, 269
extensa 229
festiva **159**, 173, **185**, 199
festucacea **13**, **21**, 28, **52**, 61
filifolia **270**, 275
filiformis **245**, 248
foeneia **13**, 14, **21**, 28
Frankii **85**, 94
Goodenovii 197, 202, 235
gracillima **33**, 38, 39, 42, **53**, 61, 183
gravida 32, 46, 81, 99, 121
intumescens **190**, 191, 201, **234**, 247
Jamesii **27**, 29, 66, 255
lanuginosa 37, 38, 39, **52**, 61, **66**, 77, **85**, 94, **157**, 173, 184, 199, **208**, 218
longirostris **111**, 112, 115
lupulina **65**, 77, 85
lurida 11, **21**, 28, 85, **124**, 146
maritima 221
nebraskensis (under C. aquatilis) [66], [77]
pallescens **182**, 183, 199
pennsylvanica 32, 45, 63, 81, 98, 120, 176, 178
praecox 158
pratensis **136**, 137, 147
pubescens **12**, 38, 39, 183, **225**, **226**, 246, 254
retrorsa **228**, 246
riparia **22**, 28, **103**, 113
rosea **102**, 113

scoparia 184, 191, 199, **228**, 229, 246
siccata 154, **185**, 200
sparganioides **66**, 77, **124**, 146, **279**, 284
sp. **85**, 94, **102**, 121, **208**, **237**
squarrosa **86**, 94
stellulata 178
stenophylla **110**, 111, 115, 134, **159**, 173, **185**, 200, 270
stipata 20, **27**, 28, 29, **66**, 77, **103**, 113, **124**, 145
stricta **3**, **11**, **22**, 28, 66, **186**, 200
tenella 153, 178
tenuis 153, **182**, 183, 199, **226**, 246, **254**, 265
tetanica (error for blanda) 11, **65**, 77, **86**, 94
tribuloides **242**, 247
trichocarpa 11, **14**, **19**, **20**, **21**, 28, **52**, 61, **85**, 94, **158**, 173, 184, 199
trisperma 178
varia **37**, 38, 39, 42, [102], [191]
virescens 38, 39
vulpinoidea 120, **238**, 240, 246
Cassia chamaecrista 17, 18, 32, 64, 76, 81, 83, 99, 100, 101, 155, 168, 180, 181, 225
Caulophyllum thalictroides 82, 99, 122, 162, 178
Ceanothus americanus 17, 32, 81, 82, 99, 142, 154, 155, **168**, 175
ovatus 168
Cephalanthus occidentalis **75**, 78, **127**, 146, **188**, 200, 258
Cerastium oreophilum **212**, 219
Chamaecyparis thyoides **131**, 147, 242, **245**, 248
Cheiranthus Menziesii 213
Chelone glabra 120, 154, 155, 178, 223, 224
Chenopodium album **25**, 29, **49**, 50, 60, **87**, 94, **104**, 114, **126**, 146, **160**, 173, **187**, **188**, 200, **208**, **209**, 218, 253, **259**, 265, **278**, 284, 293
glaucum 50
hybridum 126
leptophyllum 25, 50
Chionanthus virginica 51
Chrysopsis villosus 231
Chloris elegans 253
verticillata 18
Chrysopogon avenaceus 99, 154, 179
Chrysothamnus nauseolus 73
Cicuta maculata 32, 53, **89**, 90, 94, **106**, 114, **128**, 146, 242
Cimicifuga americana 51
racemosa 51
Cineraria palustris 255
Cinna arundinacea **12**, 163
Clematis Douglasii 57, 232, 242
Drummondii 57, 241, **242**, 247, 276
Flammula 276, 292
Fremontii 56, 57
lasiantha 57
ligusticifolia 57, 105, **232**, 233, 247, 252, 256, 276, 292
Scottii 51, 56, 57
viorna 56, 57
virginiana 51, **56**, 57, 61, **87**, 94, **105**, 114, **127**, 146, 180, 232, 233, 242, 276, 292
vitalba 104, 276
Cleome serrulata 49, 50
spinosa 32, **49**, 60, **208**, 209, 218
Cleomella parviflora 50
Collomia linearis **236**, 247
Comandra pallida 39
umbellata **39**, 42, **67**, 77, 123, **186**, 200
Convallaria majalis 180, 278
Convolvulus sepium **3**, 5
Corydalis aurea 160, 187, 225
glauca 160
montana 209
sempervirens 160, 188
Crataegus *apiifolia* 172
cerronis 157, **165**, **172**, 174, 175, **195**, 201, **211**, 216, 219, **238**, 248
coccinea 65, **112**, 115, 157, **164**, **166**, **172**, 174, 175
cordata **113**, 115, 173
flavo-carius 173
Marshallii 172
Phaenopyrum 173
Pringlei **90**, 93, 95, **130**, **143**, 146,

147, **165**, **169**, 174, 175, **237**, 247
punctata 106, **112**, 115, 129, **130**, 144, 146, 157, **164**, **172**, 174, 175, **194**, 201, 237
sp. 107, 113, **130**, **131**, 146, 147, 157, 170
tomentosa 108, 193, 194, 201, **211**, 217, 219
Cydonia vulgaris 157, **194**, 195, 201, 210
Cyperus esculentus **74**, 78
Dactylis glomerata 19
Dalea laxiflora 122, 142
Dasystoma flava 123
Decodon verticillatus 101, 121, 123, 126, **245**, 248
Delphinium formosum 179
Geyeri 232
scaposum 168, 180
tricorne 100, 122, 180
Dirca palustris 41, 42, 56, 57, 81, 82, 86, 101, 122, 154, 162, 178, 179, 180, 181, 223, 224, 259
Distichlis spicata **25**, 29, 48, **49**, 60, **67**, 77, **87**, 94, **104**, 114, **125**, 146, **160**, 173, 181, **187**, 200, 206, **208**, **209**, 218, **259**, 265, **272**, 275, **278**, 284, 289, 293
Dodecatheon Meadia 64
Doellingeria umbellata 184, 224
Dulichium arundinaceum 121, **240**, 246, **254**, 264
Draba caroliniana 100
Eatonia pennsylvanica 40, 42
Eleagnus angustifolia 180, 182
argentea 224, 232, 252, 269, 270
Eleocharis palustris 17, **74**, 78, 83, **87**, 94, **124**, 146, 181
Elephantopus carolinianus 198, 243
Elymus brachystachys 100
canadensis 32, 45, **51**, 61, **88**, 94, **162**, 163, 174, 180, **232**, 247, **270**, 275, 276
condensatus 100, 262
striatus **161**, **162**, 174
virginicus **25**, 29, **33**, 42, **51**, 60, **162**, 174, **241**, 247, **262**, 265, 276, 292
Erigeron annuus 11, **13**, 14, 19, **21**, 27, 28, 45, **52**, 61, 102, 111, 153, 182, 225, 234
arenarioides [123]
philadelphicus **22**, 28
Eriocoma cuspidata 101
Eriophorum angustifolium 255
polystachyon 256
tenellum 256
virginicum 256
viridicarinatum **255**, 256, 265
Erysimum asperum **49**, 60, **68**, 77
Euonymus obovatus 17, 46, 54
Eupatorium perfoliatum 11, 18, **32**, **74**, 78, **87**, 94, **124**, 146
serotinum 154, 181
Euphorbia arkansana coloradensis 101
commutata 36, 182, 276
corollata **50**, 60, **67**, 77, 105, 224, 251, 269, 276, 277
cyparissias 192, 193, 224
dentata, **19**, 28
humistrata **18**, 19, 28
Ipecacuanhae 277
maculata 4, 10, 11
marginata 18, 19, **105**, 114
nutans **4**, 10, 11, 18, **19**, 28
robusta 267
Euthamia graminifolia **184**, 199, **229**, 234, 242, 243, 246
Evolvulus pilosus **197**, 202
Falcata comosa 64, 81, 99, 100
Festuca confinis 64, 100, **196**, 202
Thurberi **256**, 265
Forestiera porulosa 51
Fraxinus lanceolata (*F. viridis*) **[8]**, **51**, 60, **67**, 77, **103**, 114, **127**, 146, **160**, 174, 180
Gaura biennis **158**, [173], 184
Geranium carolinianum 82
maculatum 13, 19, 22, 32, **53**, 61, **69**, 78, 81
palustre 82
pratense 82
pusillum 69, 81, 82
Robertianum 69, 81
Gillenia stipulacea 117, **144**, 145, **166**
Glaux maritima 89, 90

Grindelia squarrosa 122, 154, 155, 179, **188**, 189, 191, 196, 200, 231
Gutierrezia Sarothrae 64, 72, **73**, 78, 231, 247
Helianthus angustifolius 224
annuus 34, 42, **48**, 60, **69**, 78, 287
decapetalus 48
divaricatus **48**, 60
grosse-serratus 17, **23**, 28, 34, 47, 48, 60, **69**, 78
hirsutus **48**, 60
Kellermani **48**, 60
laetiflorus 47, **48**, 60
Maximiliani 18, **23**, 28, 34, 48
mollis **34**, 42, 47, **48**, 60
occidentalis **48**, 60
orygalis 48
rigidus 34
scaberrimus **48**, 60
strumosus 17, 23, 34, **48**, 60
tomentosus **34**, **48**, 60
tuberosus 34, 48
Heliotropium curassavicum 154
Hepatica acuta 11
acutiloba **71**, 78, **89**, 94
Hibiscus militaris 45, 123, 142, 155, 187, 223, 241
Moscheutos 81, 82, 100, 142
Hippurus vulgaris 89
Holcus lanatus 252
Homalocenchrus virginicus 17
Hordeum jubatum 19, 154, 252
nodosum [264]
pusillum **263**, 264, 265
vulgare **88**, 94, 163
Houstonia caerulea 92, **128**, **129**, 146, 277, 279
purpurea 82, 83, 92, 99
Hydrangea arborescens 277
Hydrocotyle australis 253
Hydrophyllum appendiculatum 17, 18, 31, 64, 66
capitatum 99, 179, 180, 196, 198, 207, 232, **262**, 265
Fendleri 223, 232
virginicum 99, 100, 101, 121, 122, 154, 155, 162, 168, 179, 181, 189, 223
Hymenoclea monogyna **244**, 248
Hypoxis erecta 99, 101
Ilex opaca 100
Impatiens aurea 11, 14, 17, 18, 19 **25**, 29, 32, **33**, 42, **51**, 56, 60, **161**, **162**, 174, 180, **189**, 201
Ipomoea pandurata 5, 122, 162, 239
Iris versicolor 17, 92, 99, 102, 121, 197, 223, 253, 277, **278**, 282, 284
Isopyrum biternatum 18, 37, 81. 82, 122, 178, 180
Iva frutescens 122, 126, 134, 153
Juncus balticus 101, 155, **191**, **192**, 201, **235**, 247
dichotomus 93
effusus 64, 82, 83
tenuis 17, **92**, 93, 95, **106**, 114
Juniperus communis 133
horizontalis 151, **170**, 171, 175
monosperma **217**, 219
scopulorum **93**, 95, **107**, **112**, 114, 115, **130**, **131**, 146, 147, 165, 174, **194**, 201, **237**, 247
sibirica **107**, **108**, 115, **130**, **131**, **132**, 146, 147, 150, 151, **164**, **165**, 174, **193**, **194**, 201, **210**, **211**, 218, 219, **238**, 248
utahensis **113**, 115, **211**, **215**, **216**, 218, 219, **237**, 247
virginiana **64**, 77, **90**, 95, **106**, **107**, **108**, 114, 115, **129**, **130**, **144**, 145, 146, 147, 157, **164**, **165**, **166**, **169**, **171**, 173, 174, 175, **193**, **194**, **195**, 201, **210**, **216**, 218, 219, **242**, 247
Koeleria cristata **137**, 139, 147, **189**, 200, 213, **234**, 247, **273**, 275, 292
Kuhnia eupatorioides **74**, 78, **124**, 145
Hitchockii **124**, 145
Kuhnistera purpurea 17
Laciniaria Langloisii 243
punctata 120, 154, 155, 178, 179, 211, 230, 243, **273**, 275
pycnostachya 81
scariosa 17, 18, 155, 181, 189, 198, 211, 236
spicata 99, 100, 101, 121, 154, 155, 178, 179, 181
Lactuca canadensis 18, 32, 81, 82, **85**, 92, 94, 99, **185**, 200
sativa 84, **85**, 94, 154, **185**, 200

scariola (partly under L. virosa) [85], [92], [94], 182
Larix decidua (*L. europaea*) 17, **35**, 42, **46**, **47**, 54, 55, 60, 61, **64**, **84**, 94
laricina (*L. americana*) **46**, 55, 60, **64**, 77, 91, **133**, 147, 198, 212
Lyallii 54, 55
Lathyrus decapetalus 101
palustris 101, 182
Ledum groenlandicum **195**, 202
Lepachys pinnata 99, 100
Lepargyraea canadensis 153, 154, 155, 168, 179, 180, 181, 182, 224, 252
Lepidium apetalum [17], [45], [49], [50,] [60]
densiflorum [17], [45], [49], [50], [60]
virginicum **49**, 60, **68**, 77, 209
Leptilon canadense 19, **22**, 28
Lespedeza capitata **36**, 42
Leucocrinum sp. 251
Liatris punctata **273**
Libocedrus decurrens **143**, 147, **211**, 219
Ligularia sibirica 255
Ligustrum ovalifolium 51
vulgare 51, 67, 127
Lilium elegans 279
umbellatum **279**, 280, 284
Linum Lewisii **91**, 95
usitatissimum **91**, 95
Lithospermum angustifolium 154, 155, 230
arvense 154
canescens 154, 168, 179, 180
officinalis 224
Lobelia syphilitica 46
Lonicera japonica 64
Lycium pallidum **260**, 265
vulgare **260**, 265
Lycopsis arvensis (partly under Anchusa officinalis) **128**, 146, 154, [257], [265]
Lycopus americanus **6**, **12**, **52**, 61, **87**, 94, **103**, 114, **125**, 146, **186**, 200, **208**, 218, **230**, 247
communis **125**, 146
Lygodesmia juncea **212**, 219
Lysimachia quadrifolia 76, 83, 100, 106, 121, 164, 178, 179
terrestris 76, 83, 178, 181, 182, 191, 197
thyrsiflora 76
Macrocalyx Nyctelea 46, 81, 82, 121, 180, 197
Mahonia Aquifolium 123, **138**, 147, 180
Maianthemum canadense 278, 280, 282
Malus coronaria **90**, 95, 107, **129**, 146, 157, 195, **210**, 217, 218
ioensis 164, **165**, 174
Malus **64**, **65**, 77, **106**, **107**, **108**, 114, 115, **129**, 130, 131, 146, 157, 166, **193**, 201, 217
Malvastrum coccineum 206, 225, 241, **271**, **272**, 275
Medicago sativa 182, **193**, 201, **210**, 218
Menyanthes trifoliata 101
Meriolix serrulata 178, **184**, 199, 208
Mertensia virginica 100, 155
sp. 101
Mimulus ringens 45, 154, 155, **162**, 179, 181
Monolepis Nuttalliana 126, 187, 188, 208
Muhlenbergia diffusa 82
glomerata [142], [147], **161**, 174
gracilis 187
gracillima **271**, 275
mexicana 45, **142**, [147]
Porteri [240]
racemosa 17, 45, **187**, 200
tenuiflora 100
Myosotis palustris 81, 83, 100, 154, 162, 168
Myrica cerifera 100, 134, 178, 179, 180, 197, **246**, 248
Napaea dioica 6, 17, 25, 32, 63, 81, 82, 83, 87, 98, 99, 100, 101, 121, 122, 123, 161, 168, 187, 241
Naumburgia thyrsiflora 76
Notholcus lanatus 252
Nothoscordium bivalve (*N. striatum*) **263**, 264, 265

Oenanthe aquatica 90
californica 90
Onagra biennis (*Oenothera biennis*) 6, 11, **19**, **20**, **21**, 22, 27, 28, 32, **52**, 61, **66**, 77, **85**, **86**, 94, **124**, 145, 153, **158**, 173, **184**, 185, 199, **208**, 218, 234
pallida 207
Onosmodium hispidissimum 180
occidentale 179, 232
Orchis spectabilis 178
Ornithogalum bivalve 263
umbellatum 263
Oryzopsis cuspidata 101
Oxalis Bowiei 68
corniculata 68
cymosa 17, 18, 32, **59**, 61, **68**, 78
Ortigiesi 68
violacea 46
Oxygraphis Cymbalaria **137**, 147, **208**, 218
Oxypolis rigidus 89, 106
Oxytropis Lamberti **192**
Panicularia americana 18
Panicum capillare 11, 18, 32, 63, 82, 100, 121, 224, 251, 276
virgatum **50**, 60, 64, **67**, 77, **105**, 114, 123, 155, 181, 224, 269
Parthenium integrifolium 82, 92
Pastinaca sativa 89
Pentstemon alpinus **186**, 200
barbatus 186
hirsutus (*P. pubescens*) **5**, **6**, 32, **33**, 39, 42, 67, **87**, 94, 122, 123, **186**, 200
Petalostemon purpureus 154, 155, 168, 179, 180, 181
Phacelia bipinnatifida 101, 122, 154, 155
heterophylla 179, 232
tanacetifolia 223
Phalaris arundinacea 180, **278**, 284
Phaseolus diversifolius **36**
Philadelphus coronarius 216, **217**, 219, **237**, 247
Keteleerii **237**, 247
Phleum pratense 122
Phlox divaricata 17, 81, 181, 198
subulata 81
Phragmites communis (*P. Phragmites*) **2**, **26**, 29, **104**, 114, **160**, 174, **208**, 218, 251, 294
Phryma leptostachya 99, **111**, 115, 178
Physalis heterophylla 32
pubescens 225
sp. 180
Physalodes Physalodes 17, 32
Picea canadensis 17, 277
mariana **195**, 202
Pinus palustris **239**, 248
rigida 46
taeda **198**, 202, **211**, 219, **238**, **239**, **243**, 248
virginiana **84**, 94, **195**, 202
Pisum sativum 182
Plantago aristata 24, **279**, 284
eriopoda 24
lanceolata 23, **279**, 284
Purshii 24
Rugelii **23**, 28, 279
virginica 23, 24
Poa compressa 19
longiligula 101
Podophyllum peltatum **59**, 61
Polemonium reptans 32, 45, 64, 65, 76, 81, 82, 99, 101, 122, 156, 162, 179, 181, 197, **198**, 202, 261
Polygala Senega 45, 75, 76, 81, 82, 83, 99, 101, 154, 155, 162, 181, 182
Polygonatum biflorum 154, 278, **282**, 284
commutatum 180, 278, **282**, 284
Polygonum amphibium 82
aviculare 268, **273**, 275
emersum 18, 31, **53**, 61, **69**, 78
pennsylvanicum 18
scandens 81
virginianum 18
Polymnia canadensis 82, 92, 101
Populus *angulata* 36
angustifolia 36
balsamifera 36
canadensis 36
deltoides 17, **35**, 36, 42, **46**, 60, **64**, 77
grandidentata 36

Medusae 36
monilifera 36
tremuloides 36, **47**, 60, **133**, 147, **198**, 202, **212**, 219
trichocarpa 36
Porteranthus stipulatus 117, 120, **144**, 145, 147, 157, **166**, 175
Prunus americana 71
Cerasus 71
divaricata 70
pumila **89**, 94
serotina **71**, 78, **89**, 94
spinosa 70, 71
virginiana 71
Pseudotsuga mucronata **198**, **199**, 202, **212**, 219
Psoralea Onobrychis 18, 64, 76, 81, 99, 100, 101, 122, 162, 168
Ptelea trifoliata **6**, 8, **22**, 28, **50**, 60, **260**, 265
Puccinellia airoides **137**, 147, **208**, 218
Pulicaria dysenterica 101, 155, 156
Pulsatilla hirsutissima 26
Pyrus communis 113, 131, 157, 194, 217
japonica 93
Quamasia hyacinthina 18
Quercus alba 84
Phellos **239**, 248
rubra **195**, 202, **238**, **239**, 248
velutina **84**, 94
Ranunculus abortivus **40**, 42, 215, 295
acris 252
bulbosus 252
cymbalaria **137**, 292
recurvatus 101
sceleratus 251, 252
septentrionalis 26, 98, 155
Rhamnus alnifolia 180, **187**, 200
caroliniana **52**, 61
cathartica **52**, 61, 180, 252
lanceolata **52**, 61
Purshiana 252, **271**, 275
Ribes aureum 17, 22, 32, 33, 37, **53**, 61, 65
Cynosbati 11, **12**, 18, 19, 20, 22, 32, **33**, 37, 38, 42, **53**, 61, **86**, 94, 99, **102**, 111, 113, 133, 178, **182**, 199, 212, **225**, **237**, 246, **254**, 265, 269, 270
floridum 19, 20, 22, 33, 53, 103, 197, 254
gracile 12, 17, 19, 22, **65**, 77, **86**, 94
Grossularia 42
longiflorum 254
rotundifolium **53**, 61, 66, **86**, 94
rubrum 53, 65, 86, 103, 133
Uva-crispa 20, 22, **33**, 42, **53**, 61, **65**
Roripa sinuata 49, 50
Rosa *arkansana* **47**, 60, 106
carolina **47**, 60
humilis **23**, 28, **47**, 60
lucida 47
nitida **47**, 60
pratincola **106**, 114
sp. 4
Rubus allegheniensis 207
Rudbeckia laciniata 63, 64, 65, **76**, **81**, 82, 92, 120, 121, 142, 153, 178, 181, 182, 197, 277, **279**, 284
triloba 63, 64, 178, 179, 180
Ruellia ciliosa **69**, 70, 78, 294
strepens **69**, 70, 78, 224, 294
Rumex crispus **2**, **104**, 114, **160**, 174 **208**, 218
obtusifolius **2**
Rynchospora alba 101
Salix amygdaloides **54**, 56, 61
Bigelowii 52, 55
brachystachys 55
discolor 17
herbacea 56
longifolia 5
repens 56
sp. **84**, 94
Salsola Tragus 49, 50
Salvia lanceolata **36**, 42
Sambucus canadensis **14**, 19, **21**, 22, 28, 32, **52**, **65**, 77, **85**, 94, **124**, 146, 158, 159
Sarcobatus vermiculatus **87**, 104, **126**, 146, 208
Schedonnardus paniculatus 17, 100, 122, 179, 207, **271**, 275
Scirpus americanus **109**, 115

atrovirens **6**, 12, **52**, 61, **86**, 94, **103**, 114, 125, **186**, 200, **229**, 247
cyperinus **125**, 146, **208**, 218
Eriophorum 230
fluviatilis **89**, 90, 94, **106**, 114, **128**, 146, **242**, 247, 253
maritimus 90
microcarpus 223, 230
rubrotinctus 223, 230
sylvaticus 223, 230
Scolochloa festucacea 252
Secale cereale 88, **127**, 146, **[257]**, 265
Senecio aureus **255**, 256, 265
cacaliaefolius 255
Douglasii (error for S. spartioides)
ductoris 256
lugens (error for S. spartioides)
obovatus 17, 18, 32, 81, 82, 92, 99, 101, 120, 121, 240
palustre 255
spartioides [178], [180], **[189]**, [197], [200], **[231]**, 247
Sidalcea oregana 155, 179, 191, 207
sp. 161
Sieglingia seslerioides 6
Silphium integrifolium **72**, 78, 82, **88**, 92, 94
laciniatum 93
perfoliatum 32, 38, 65, **72**, 82, 83, **88**, **92**, 93, 94, 95, 101, **106**, 109, 114, 236
terebinthinaceum 82, **88**, 92, 94
Sium cicutaefolium 90, **242**, 247, 253
latifolium 89
Sisyrinchium gramineum (*S. graminoides*) **128**, **129**, 146
Sitanion elymoides 262
longifolium **162**, 163, 174, **187**, 200
Smilacina stellata 99, **282**
Smilax herbacea **26**, 29, 81
hispida **26**, 29, **33**, 42, **67**, **77**, 100, 104, 114, 121, 122, 127, **134**, 135, 147, **160**, 173, **187**, 200, 251
rotundifolia 134, 135
Solidago caesia **27**, 29, **38**, **42**, 178
canadensis 11, 14, 19, 20, **27**, 29, 32, **37**, 38, 39, 42, 45, **66**, **73**, 77, 78, 98, 99, 101, 102, 110, 111, **124**, 146, 153, 178, 182, 184, **188**, 190, 200, 224, 229, 231, **234**, **238**, **240**, 242, 243, 246, 247, **254**, 264, 279
flexicaulis **37**, 42
glaberrima **238**, 246
lanceolata **184**
missouriensis **238**
mollis 231, **238**, 246
nemoralis 184, 190
rigida 18, **27**, 29, 32, 38, 179
rugosa 184, **190**, 201, **238**, 242, 246
serotina 11, 20, 21, **27**, 29, **37**, 38, 42
trinervata **73**, 78
ulmifolia **27**, 29, 46
Sophia incisa (error for S. brachycarpa) [49], [60], [68], [77]
incisa (error for S. intermedia) [49], [50]
Sorbus americana **90**, **93**, 95, 100, **107**, **112**, **113**, 114, 115, **130**, **131**, 132, 146, 147, 157, **165**, **166**, 174, **194**, 201, **211**, 219
Aria 133
aucuparia 133, **165**, 174, 211, 217
hybrida 133
torminalis 133
Spartina cynosuroides (partly for S. Michauxiana) [8], [31], **[51]**, [60], [67], [75], [76], [77], [78], [83], [103], [106], [114], [127], [146], [156], [160], [164], [174], [181], **258**, 265
gracilis 154
Michauxiana (partly under S. cynosuroides) [8], [31], **[51]**, [60], [67], [75], [76], [77], [78], [83], [103], [106], [114], [127], [146], [156], [160], [164], [174], 181, **188**, **198**, 200, 202, **236**, 247, **258**, **261**, 265, **271**, 275, **281**, 283, 284
patens 181
polystachya **127**, 146
stricta **127**, 146
sp. 180
Sphaeralcea incana 223, **240**, 247
lobata 223, 224, **241**, 247

Spiraea lobata 5
stipulata 145
Sporobolus asperifolius 63, 179, 206, **240**, 247
cryptandrus (partly error for Stipa viridula) [109], [115], **223**, **270**, 275, 280
heterolepis 18, **279**, 284
longifolius **7**, 17, **22**, 28, **50**, 60, **67**, 77, 225
neglectus 32, 182, 274
vaginaeflorus **273**, 275, 280
Stanleya pinnata 50
Steironema ciliatum 46, 63, 65, 66, **76**, 78, 83, **106**, 114, 156, 157, **164**, 174, 181, 198, 236, **261**, 265, 267, **271**, 275, 282, 283
lanceolatum 76, 83, 156, 157, **164**, 174, 236, 282
Stenolobium molle 73
stans **73**, 78, **88**, 94
Stipa comata 75, **231**, 247
spartea 18, **57**, 61, 163, **188**, 200
viridula (partly under Sporobolus cryptandrus) **75**, 78, [109], [115], 154, **163**, 174, 213
sp. **188**, 200
Strophostyles helvola **36**, 42
Stylophorum diphyllum 17
Symphoricarpos oreophilus 197
parviflorus 168
pauciflorus 45, 153, 154, 179
racemosus 17, 18, 32, 45, 63, 98, 99, 100, 101, 122, 154, 155, 179, 180, 181, 189, **196**, 202
Syringa vulgaris 51
Taraxacum Taraxacum 13
Tecoma mollis 73
radicans 73
stans 73
Thalictrum alpinum 154, **161**, 174, 232
dioicum 64, 76, 81, 82, 99, 122, 127, **139**, 140, 147, 154, 161, 168, 178, 233, 242, **256**, 265
Fendleri 140, 223, 232, 242, 256
occidentale 140
polygamum 101, 122, 179
purpurascens 154
sparsiflorum 139, 140
venulosum 140
Tissa canadensis 180, 181, 188, 190, 209
Tithymalis arkansanus coloradensis 154
Tridens flavus (*Tricuspis seslerioides*, *Triodia cuprea*) **6**, **22**, 28, **50**, 60, **259**, 265
Trifolium carolinianum **244**, 248
medium 193, 210
pratense 182, 193, 210
repens 193, 210
Trillium cernuum 180, 278
recurvatum 37, 81, 82, 98, 282
Triosteum perfoliatum 81, 100, 101
Tripsacum dactyloides 18
Trisetum majus 180, **213**, 219
subspicatum **213**, 214, 219, **234**, 247
Triticum vulgare **19**, 28, **88**, 94, **162**, 163, 174, 276
Troximon glaucum 136
Tsuga canadensis 91, 277
Ulmaria rubra **5**
Urtica gracilis 11, 19, **22**, 28, 52, 63, **66**, 77, **103**, 109, 113, 134, **158**, 159, 173, **186**, 197, 200, 269, 270
Uvularia grandiflora 179, 180, 278, 280, 282
perfoliata 45
Vaccinium pennsylvanicum **166**, 175
Vitis-idaea 167
Vagnera racemosa 278, 282
stellata 180, 225, 278, 280, 281, **282**, 284
Verbena stricta **7**, 17, **22**, 28
urticifolia 18, **22**, 28, **50**, 60, **67**, 77, 122
Vernonia arkansana 121
crinita **198**, 202
fasiculata **239**, **243**, 248
gigantea **211**, 219
sp. **274**, 275
Viola cucullata 11, 32, 37, 81, 99, 100, 101, 120, 123, 155, **163**, 174, **230**, 247
Nuttallii **230**, 247

papilionacea 63, 76
pubescens 82
primulaefolia 164, 230
septentrionalis 180
sororia 154
striata 98, 99, 231
Viorna Douglasii 180
Scottii 105, 114
Xanthium canadense 11, 14, 17, 18, 19, 22, 32, 46, 71, 74, 78, 236
sp. 88, 94
Xanthoxylum americanum 18, 32, 50, 63, 100, 142, 168, 179, 206, 207, 225
Zea Mays 18, [59], 61, 68, 69, 78

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA.